End of topic check list for CELL MEMBRANES & TRANSPORT

Tick as appropriate:

RED : I do not know about this

AMBER: I have heard about this but have not learned this yet. I am unsure on this.

GREEN: I have heard about this and I have learned this. I am confident about this.

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| Topic | RED | AMBER | GREEN |
| 1. All cells are surrounded by a membrane which may be called the cell surface membrane or the plasma membrane. |  |  |  |
| 1. The cell membrane appears under the electron microscope as a double line. |  |  |  |
| 1. The usual distance across the cell membrane under the electron microscope is 7-8 nm. |  |  |  |
| 1. The principal biochemical constituents of the cell membrane are protein and phospholipid. |  |  |  |
| 1. The phospholipid molecules are arranged as a bilayer with hydrophilic heads and hydrophobic tails. |  |  |  |
| 1. Some proteins lie on the surface of the bilayer and some are partly embedded, whilst others extend completely across it. |  |  |  |
| 1. This model is referred to as the ‘fluid mosaic’ model because the components are free to move with respect to each other. |  |  |  |
| 1. You should be able to draw a simple diagram to illustrate the fluid mosaic model including the labels: phospholipid bilayer, proteins, hydrophilic pores/channels (in some proteins), and glycoproteins. |  |  |  |
| 1. The major functions of the cell membrane include taking up nutrients and other requirements; secreting chemicals; cell recognition. |  |  |  |
| 1. The cell surface membrane is selectively permeable to water and some solutes. |  |  |  |
| 1. You should be able to interpret the results of an investigation into factors, heat and organic solvents, affecting the permeability of a cell membrane. |  |  |  |
| 1. Lipid-soluble substances can move through the cell membrane more easily than water-soluble substances, which use temporary protein channels. |  |  |  |
| 1. You should be able to define the term ‘diffusion’. It is the movement of molecules or ions from a region of high concentration to one of low concentration. |  |  |  |
| 1. The rate of diffusion across the membrane depends on: the concentration gradient, temperature, size of the molecule, lipid solubility. |  |  |  |
| 1. You should be able to define the term ‘osmosis’. It is a particular form of diffusion in which water molecules move down a water potential gradient through a selectively permeable membrane. |  |  |  |
| 1. Water potential is the potential for water to move out of a solution by osmosis. It has the symbol ψ (psi). Pure water has the highest water potential, given the value zero. All solutions have a lower potential than water because they have a lower proportion of water molecules, therefore ψs always has a negative value. |  |  |  |
| 1. In a plant cell the water potential is the sum of two factors: the solute potential (ψs) which is the effect of solutes lowering the water potential of the cell sap (negative value) and ψp which is the opposite pressure provided by the cell wall and is usually positive (ψcell = ψs+ ψp). |  |  |  |
| 1. You should be able to use a given equation and interpret data. |  |  |  |
| 1. When a cell loses water it shrinks; the cytoplasm of a plant cell will draw away from the cell wall and the cell is described as being plasmolysed. |  |  |  |
| 1. A cell will gain water if placed in a hypotonic solution; an animal cell will burst but a plant cell will continue to take in water until prevented by the opposing wall pressure when the cell is described as being fully turgid. |  |  |  |
| 1. Facilitated diffusion allows rapid exchange due to substances being helped across the membrane by special carriers. ATP is not needed. |  |  |  |
| 1. Phagocytosis is where a large particle may enter the cell, become enclosed by a membrane to form a vesicle and be transported through the cytoplasm. |  |  |  |
| 1. You should be able to draw a diagram to illustrate phagocytosis. |  |  |  |
| 1. Secretion or exocytosis refers to substances leaving the cell after being transported through the cytoplasm in a vesicle. |  |  |  |
| 1. The cell membrane is continually having portions removed or added to it through phagocytosis and secretion. |  |  |  |
| 1. Pinocytosis is the entry of liquid by the same mechanism as phagocytosis. |  |  |  |
| 1. Active transport requires energy from respiration and takes place against a concentration gradient so allowing a solute to be accumulated within a cell. |  |  |  |
| 1. Active transport will not take place in the presence of a respiratory inhibitor such as cyanide. |  |  |  |
| 1. A solute may be taken across a cell membrane by a special carrier molecule. |  |  |  |